

Application No.: 10/776155Case No.: 59526US002Amendments to the Drawings:

Please add a replacement sheet of drawings 8/8, enclosed herewith, which includes a new Fig. 15.

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REMARKS

Claims 1 to 43 are pending. Claims 4, 23, 24 and 35 have been canceled. Claims 1 and 16 are amended. The amendments find basis in the application as filed, for example, at page 13, lines 6-14, page 18, lines 3-7, page 19, lines 8-19, page 22, line 19 – page 23, line 7, page 24, lines 1-15, and Figs. 2B-2C and 7. Thus, no new matter has been added.

Drawings

The drawings were objected to under 37 CFR 1.83(a). The Applicant has added a new Fig. 15, which shows an image-forming device having a plurality of mirrors. Brief Description of the Drawings and Detailed Description have been amended to include a description of Fig. 15. Fig. 15 and the associated descriptions are derived from US 5,442,414, e.g., Fig. 1 and col. 2, lines 47-68, which have been incorporated by reference in the present application. Thus, no new matter has been added.

In summary, Applicant submits that the objections to the drawings have been overcome and should be withdrawn.

§ 102 Rejections

Claims 1-9 and 11-13 stand rejected under 35 USC § 102(b) as being anticipated by Serizawa et al. US 4,733,335 ("Serizawa"). The Applicant respectfully submits that Serizawa does not disclose all elements of the amended claims.

Serizawa is directed to vehicular lamps and shows, in Fig. 8, a diode segregating member 151, which is in the form of a plate made of opaque plastic and has a number of diode-accommodating holes 156, which are "through-holes" whose walls form a parabolic reflecting surface 157. (Serizawa, col. 8, lines 40-49). Serizawa thus does not teach a pyramid collector in which light originating from the emitting surface at sufficiently large angles experiences total internal reflection. Instead, the parabolic reflective surface 157 reflects light incident at any angle, without a possibility of total internal reflection, which can only occur at an interface of a high refractive index material and a low refractive index material, where the light is incident from the high refractive index material side.

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Further, Serizawa does not teach pyramid collectors “wherein the shape and size of the proximal end are different from the shape and size of the distal end.” Instead, all embodiments of Serizawa show “through-holes” with both ends having the same shape, for example, both being circular as in Fig. 8, or both being square as in Fig. 7.

Therefore, Serizawa does not teach all elements of claim 1 for at least the above-described reasons and claim 1 is patentable over Serizawa. Dependent claims 2-9 and 11-13 are patentable for at least the same, as well as additional reasons.

Serizawa also does not disclose the additional limitations of claims 3 and 6. As it is clear from Fig. 12, the bottom of the parabolic reflector 157 is much larger than the light source 111. In addition, Serizawa contains no disclosure concerning the size and shape of any emitting surface.

With regard to claim 5, Serizawa does not teach that the through-holes can have one end that is square and another end that is rectangular. Contrary to the Examiner’s suggestion, Fig. 7 is a perspective view showing square outer ends of the diode-segregating member. Furthermore, as it is evident from the figure and its description at col. 7, lines 7-17, the through-holes are hollow.

With regard to claim 11, Fig. 7 of Serizawa does not show any pincushioned shapes. Instead, the ends of the through-holes shown in that figure are square.

With regard to the Examiner’s discussion of claim 13, col. 4, lines 50-52, of Serizawa refers to the embodiment of Fig. 2, which does not show any structures that could be referred to as collectors within the meaning of the present disclosure, and the dimensions cited therein instead refer to the size of the condenser lenses 127.

The rejection of claims 1-9 and 11-13 under 35 USC § 102(b) as being anticipated by Serizawa has been overcome and should be withdrawn.

Claims 16, 17, 19, 21-27, 31 and 35-43 stand rejected under 35 USC § 102(b) as being anticipated by Tiao et al. US 6,318,863 (“Tiao”). The Applicant respectfully submits that Tiao does not disclose all elements of the amended claims.

With regard to claim 16, Tiao does not disclose a plurality of light source modules, each light source module including a pyramid collector mounted onto one emitter. Instead, Tiao discloses, e.g., at col. 3, lines 12-13, that the first end of each tapered light pipe is “closely connected with each of the light emitting modules 202.” Therefore, the light pipes are not parts of

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the light source modules. This is consistent with all figures of Tiao, which show a gap between the light source modules and the light pipes without any means of mounting these separate elements onto one another.

In addition, Tiao does not teach pyramid collectors "wherein the shape and size of the proximal end are different from the shape and size of the distal end." Instead, Tiao states, for example, at col. 5, lines 43-47, that the pipes can be conical, rectangular, or cylindrical. All of these types of light pipes have first ends that have the same shapes as second ends.

Therefore, Tiao does not teach all elements of claim 16 for at least the above-mentioned reasons and claim 16 is patentable over Tiao. Dependent claims 17, 19, 21-27, 31 and 35-43 are patentable for at least the same, as well as additional reasons.

For example, Tiao does not disclose the additional limitations of claim 19. All embodiments of Tiao include light source modules that have optical axes aligned with each other and, therefore, cannot be referred to as "aimed substantially into the illumination target."

With regard to claims 21, 22 and 25, Tiao does not disclose a proximal end of a pyramid collector in contact with an emitting surface, having approximately the same shape and dimensions as the emitting surface, or fitted around the emitting surface. These affirmative limitations cannot be simply inferred from Tiao's statement that the first end of each tapered light pipe is "closely connected with each of the light emitting modules 202." Furthermore, Tiao shows appreciable gaps between the light source modules and the light pipes.

With regard to claim 36, Tiao states, for example, at col. 5, lines 43-47, that the pipes can be conical, rectangular, or cylindrical. All of these types of light pipes have first ends that have the same shapes as second ends.

With regard to claim 26, Tiao does not disclose a straight rectangular pipe section comprised in each light source module. Element 420 in Fig. 4A is separate from the array of light pipes 410 and, as it is apparent from Fig. 4A, each light pipe does not comprise a straight rectangular pipe section, as required by claim 26.

With regard to claim 27, element 920 is an array of lenses and these lenses are not comprised in either the array of light sources 900 or in the array of light pipes 910. As it is apparent from Fig. 9A these elements are separated by appreciable gaps.

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With regard to claim 37 and claims 38-40 dependent thereon, Tiao does not disclose an illumination system configured such that the system of optical elements images the distal end of each pyramid collector onto the illumination target. Fig. 9A is a simplified schematic representation of an optical system, from which it is impossible to discern any particular imaging characteristics of the system, and the description of Tiao is silent in that respect.

The rejection of claims 16, 17, 19, 21-27, 31 and 35-43 under 35 USC § 102(b) as being anticipated by Tiao has been overcome and should be withdrawn.

§ 103 Rejections

Claim 10 stands rejected under 35 USC § 103(a) as being unpatentable over Serizawa in view of Yasumoto et al US 4,733,355 ("Yasumoto"). The Applicant respectfully disagrees. Claim 10 is not obvious over the cited references for the reasons presented above in connection with claims 1 and 8. In addition, the Applicant respectfully submits that Yasumoto does not disclose the additional elements of claim 10. For example, Yasumoto, at col. 4, line 50-51, describes the element 44 as "a plurality of spaced ribs." Therefore, Yasumoto does not teach or suggest "a generally disc-shaped flange" as required by claim 10. Further, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claims 14 and 15 stand rejected under 35 USC § 103(a) as being unpatentable over Serizawa in view of Tai et al. US 5,506,929 ("Tai"). The Applicant respectfully disagrees. Claims 14 and 15 are not obvious over the cited references for the reasons presented above in connection with claim 1. In addition, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claim 18 stands rejected under 35 USC § 103(a) as being unpatentable over Tiao in view of McClelland et al. US 6,201,629 ("McClelland"). The Applicant respectfully disagrees. Claim 18 is not obvious over the cited references for the reasons presented above in connection with claim 16. In addition, McClelland does not disclose the additional limitations of claim 18. McClelland is directed to a torsional micro-mechanical mirror system, but it does not disclose or suggest an illumination system wherein a plurality of light source modules is disposed within a non-radially symmetrical aperture having a long dimension and a short dimension and as further

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required by claim 18. Further, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claim 20 stands rejected under 35 USC § 103(a) as being unpatentable over Tiao in view of Anderson US 5,997,150 ("Anderson"). The Applicant respectfully disagrees. Claim 20 is not obvious over the cited references for the reasons presented above in connection with claim 16. In addition, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claims 28 and 29 stand rejected under 35 USC § 103(a) as being unpatentable over Tiao in view of Yasumoto. The Applicant respectfully disagrees. Claims 28 and 29 are not obvious over the cited references for the reasons presented above in connection with claims 16 and 27. In addition, Tiao does not teach "a generally disk-shaped flange" for the reasons presented above, and it does not teach "a straight pipe portion." Element 45 refers to "wing members" that are alternately disposed with "ribs 44." (Yasumoto, col. 4, lines 54-56). Further, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claims 30 and 32 stand rejected under 35 USC § 103(a) as being unpatentable over Tiao in view of Serizawa. The Applicant respectfully disagrees. Claims 30 and 32 are not obvious over the cited references for the reasons presented above in connection with claim 16. In addition, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

Claims 33 and 34 stand rejected under 35 USC § 103(a) as being unpatentable over Tiao in view of Tai. The Applicant respectfully disagrees. Claims 33 and 34 are not obvious over the cited references for the reasons presented above in connection with claim 16. In addition, the requisite motivation to combine the cited references and reasonable expectation of success are absent.

In summary, the rejection of claims 10, 14, 15, 18, 20, 28, 29, 30, 32, 33 and 34 under 35 USC § 103(a) as being unpatentable over Serizawa, Yasumoto, Tai, Tiao, McClelland and Anderson has been overcome and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is respectfully requested.

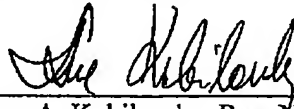
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Allowance of claims 1-3, 5-22, 25-34 and 36-43, as amended, at an early date is earnestly solicited.

Respectfully submitted,

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Date

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